

#### CERTIFICATE OF APPROVAL No 6/9C/42

This is to certify that the pattern and variants of the

Toledo Weighing Instrument Model 2084

submitted by Toledo-Berkel Pty Ltd, 525 Graham Street, Port Melbourne, Victoria, 3207,

have been approved under the Weights and Measures (Patterns of Instruments) Regulations as being suitable for use for trade.

Pattern: approved 24/2/75 reviewed 24/10/80

- . capacity of 125 kg, with Type 8130 mass indicator displaying up to 2500 increments.
- . with Toledo 132 basework-selector unit.

Variation No 1: approved 14/12/76 (reviewed 24/10/80)

. with 7, 11 or 22 kg load cell, Type 0721.

Variation No 2: approved 2/8/77 (reviewed 24/10/80)

. with the 8130 mass indicator displaying up to 3000 increments.

. with an 8134 mass indicator displaying up to 3005 increments.

. with basework of capacity 155 kg.

Variation No 3: approved 18/7/79 (reviewed 24/10/80)

. the 8134 indicator without automatic tare cancelling.

- instrument Model 280 with maximum capacity 50,1 kg by
- 0,02 kg scale intervals using Type 8135 indicator.
- . Model 280 with alternate cabinet and component arrangement.
- . with the 8135 mass indicator displaying up to 3005 increments.
- . with Type 0721 load cell of capacity 45 or 90 kg.
- . with Type 0723 load cell of capacity 7, 11, 22, 45 or 90 kg.
- . with other Commission-approved baseworks.

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Variation No 4: approved 29/10/79 (reviewed 24/10/80)

- . a mechanical lever basework of 750 kg capacity with Toledo Type 0721 load cell.
- . Toledo 133 basework-selector unit.

Variation No 5: approved 24/10/80

- . with Toledo Model 2085 basework of 30,05 kg capacity.
- . with Toledo Model 2085 basework of 60,1 kg capacity.

The pattern and variants are described in Technical Schedule No 6/9C/42 and Variations Nos 1, 2, 3, 4 and 5, issued on 29/5/75, 27/1/77, 23/9/77, 31/7/79, 8/11/79 and 7/11/80, and in drawings and specifications lodged with the Commission.

The approval is subject to review on or after 1/10/85.

All instruments conforming to this approval shall be marked with the approval number "NSC No 6/9C/42".

This Certificate replaces that issued on 8/11/79, which may be destroyed.

Signed

Executive Director



### TECHNICAL SCHEDULE No 6/9C/42

Pattern: Toledo 2084 Weighing Instrument

<u>Submittor</u>: Toledo-Berkel Pty Ltd, 525 Graham Street, Port Melbourne, Victoria, 3207.

Date of Approval: 24 February 1975

### Conditions of Approval:

- 1. The first ten instruments conforming to this approval are submitted for examination by the Commission prior to their verification by the State Weights and Measures Authorities. Weights and Measures Authorities should not verify any instrument conforming to this Schedule until advised by the Commission.
- 2. All instruments conforming to this approval shall be marked "NSC No 6/9C/42".

### Description:

The pattern (see Figure 1) is a platform weighing machine of capacity up to 125 kg. It comprises a mechanical lever basework (see Figures 2 and 3) with a Toledo "25-lb" cantilever type load cell as the resistant mechanism (see Figure 4). The weight indicator Type 8130 (see Figure 5) converts the mass information from the load cell into a digital weight indication of up to 2500 increments. The motion detector prevents the weight indicator from displaying the mass until the mass signal sampled in successive counting periods is the same, that is, the instrument is in equilibrium. Zero is set by a screwdriver adjustment. A zero-check push-button displays zero in 1/5-graduation increments. Lights indicate when the weight displayed is below zero or the load is above capacity; the indicator is blank when the load is above capacity (see Figure 5).

The basework is supported on four adjustable feet and is fitted with a level indicator adjacent to which is a notice advising that the basework must be level when in use.

An output socket provides digital mass information to peripheral equipment. The output is inhibited by the motion detector until the instrument is in equilibrium or when the zero-check push-button is operated. The use of peripheral equipment will not affect the operation of the instrument.

The 8130 weight indicator is retained in its cabinet by a lead-and-wire seal.

The headwork or basework of this instrument is not interchangeable with other approved headworks or baseworks.

The instrument is marked:

$$\begin{array}{c} \text{III} \\ \text{Max} &= 125 \text{ kg} \\ \text{Min} &= 2,5 \text{ kg} \\ \text{d}_{d} &= 0,05 \text{ kg} \end{array}$$

The approval includes a Toledo 132 basework selector unit allowing the mass information from up to six load cells to be displayed on the one 8130 weight indicator (see Figure 7). The calibration circuits of the 8130 weight indicator are placed in the 132 basework selector, together with a calibration circuit for each additional basework. The 132 basework selector is sealed by a lead-plug seal over a screw which retains the unit in its cabinet. The serial number of each load cell and the cable from each load cell are sealed to the basework selector (see Figure 8).

Special Tests:

- 1. <u>Zero Balance</u> When the indicator is adjusted to zero with the zero-check push-button depressed, it should indicate zero when the zero-check push-button is released.
- 2. Level Sensitivity When the instrument is tilted so that the bubble in the level indicator moves 2 mm, the zero should not change by more than 2 graduations, and when zero is reset in the tilted position the instrument should satisfy the weighing-accuracy specification, that is,  $\pm \frac{1}{2}$  graduation for the first 500 graduations,  $\pm 1$  graduation for graduations over 500 and up to 2000,  $\pm 1\frac{1}{2}$  graduations over 2000 graduations.
- 3. Load-cell Creep Leaving a maximum-capacity load on the load

receptor for a period of 30 minutes should not cause the weight indicated to be incorrect, and on removal of the load the weight indicated should be zero.

- 4. <u>Motion-detector Sensitivity</u> The removal at any load of a load equal to 1,5 increments from the load receptor should cause the weight indicator to go blank for a perceptible period before indicating the new load.
- 5. <u>Test Loads</u> The application of the test loads specified in Table 1 and the display of these loads within the applicable tolerance is one method of checking that the instrument operates in accordance with the approved design.

			<u>-</u>	TABLE 1			
Test	Load in G	raduations	*				
0	. 10	25	60	120	250	698,5	
1	12	<b>3</b> 0	70	140	300	798,5	
2	14	35	80	160	350	898,5	
3	16	40	90	180	400	998,5	
4	18	45	100	200	450	1198, 5	
5	20	50			500	1398, 5	
6						1598,5	
7						1798,5	
8						1998, 5	
9						2498	

\* Test Load = Number of graduations × graduation value

<u>Note</u>: The test load should include a test at capacity, less the tolerance and less 0,5 graduation.



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# TECHNICAL SCHEDULE No 6/9C/42 VARIATION No 1

Pattern: Toledo Weighing Instrument Model 2084

<u>Submittor</u>: Toledo-Berkel Pty Ltd, 525 Granam Street, Port Melbourne, Victoria, 3207.

Date of Approval of Variation: 14 December 1976

The modification described in this Schedule applies to the pattern described in Technical Schedule No 6/9C/42 dated 29 May 1975.

All instruments conforming to this approval shall be marked "NSC No 6/9C/42".

### Description:

The approved modification provides for the resistant mechanism to be a Toledo 7-kg, 11-kg or 22-kg cantilever load cell. The force applied to each load cell is in the range:

- 1. 7-kg load cell between 30 and 70 N;
- 2. 11-kg load cell between 45 and 110 N; and
- 3. 22-kg load cell between 90 and 215 N.

A single lever ratio is used and the load cells are changed depending on the maximum capacity of the instrument. The instrument maximum capacity for each load cell is:

- 1. 7-kg load cell instrument maximum capacity 10 kg to 25 kg;
- 11-kg load cell instrument maximum capacity 25 kg to 50 kg; and
- 3. 22-kg load cell instrument maximum capacity 50 kg to 125 kg.



## TECHNICAL SCHEDULE No 6/9C/42 VARIATION No 2

Pattern: Toledo Weigning Instrument Model 2084

Submittor: Toledo-Berkel Pty Ltd, 525 Granam Street, Port Melbourne, Victoria, 3207.

Date of Approval of Variation: 2 August 1977

The modifications described in this Schedule apply to the patterns described in Technical Schedule No 6/9C/42 dated 29 May 1975 and Technical Schedule No 6/9C/42 - Variation No 1 dated 27 January 1977.

All instruments conforming to this approval shall be marked "NSC No 6/9C/42".

### Description:

The approved modifications provide for:

- 1. the 8130 weight indicator displaying up to 3000 increments;
- an 8134 weight indicator (see Figure 9) converting the output from the load cell into a digital weight indication of up to 3005 increments. The weight indication will be blank above capacity.

The instrument will automatically rezero within 0,25e whenever it comes to rest within 0,45e of zero; this is indicated by the word "zero" being illuminated. A push-button marked "Z" is provided for rezeroing the instrument when the zero is outside the automatic zero range.

A push-button marked "T" allows automatic taring of a container on the load receptor to within 0,25e. On removal of the container the value of the tare to the nearest whole graduation is indicated on the weight indicator prefixed by a minus (-) sign. The tare is subtractive and of maximum

effect equal to the capacity of the instrument. When a tare is selected the word "tare" will illuminate and when the filled container is weigned the word "net" will also illuminate. The tare is cancelled automatically when the load is reduced to less than 10e. The word "gross" will then be illuminated and the instrument will "gross" weign until a tare is selected.

Successive operations of the "verify" button marked "V" can be used to blank out the indicator or display "all-8", minus (-) sign, tare, gross, net and kg while the button is depressed. This checks that all displays are working properly.

The 8134 weight indicator is retained in its cabinet by a lead-and-wire seal as it is too fragile for a stamping-plug seal. The serial number of the load cells, and the cable from the load cell, are sealed to the weight indicator (see Figure 10).

An alternative nousing for the 8134 weight indicator is illustrated in Figure 11. With this nousing the load cell is permanently connected and the load cell serial number is attached to the weight-indicator seal.

The neadwork or basework of this instrument is not interchangeable with other approved neadworks or baseworks.

The instrument is marked adjacent to the weight reading face, for example:

 $\begin{array}{rcl} \text{(III)} \\ \text{Max} & = & 100,5 \text{ kg} \\ \text{Min} & = & 5 \text{ kg} \\ \text{d}_2 & = e & = & 0,1 \text{ kg} \\ \text{T} & = & - & 100,5 \text{ kg} \end{array}$ 

A button marked "P" and keyboard with ten push-buttons numbered from 0 to 9 may be used by the operator to provide a transfer-data instruction or numerical data to the output socket; it does not provide data to the weigning instrument.

An output socket which has provision for sealing may be used to provide information to peripheral devices which are not a part of the measuring instrument.\* These devices, which may

<sup>\*</sup> The measuring instrument examined and approved by the Commission is limited to the devices which determine the value of a physical quantity, control the measurement, and indicate the result of the measurement on a visual display, for example, a seven-segment indicator.

only be provided with the authorisation of the Weights and Measures Authority of the State, may, for example, print receipts or store and process the data, etc. This output information is inhibited until the signal sampled in successive counting periods is the same, that is, the instrument is in equilibrium.

The use of such peripheral equipment will not affect the operation of the weighing instrument.

3. The basework of capacity 155 kg.

#### Special Tests - 8134 Weight Indicator\*

<u>Zero range</u> — the maximum range of the push-button zero device should not exceed 4% of the capacity of the instrument ( $\pm$  2% approximately). Satisfactory setting may be checked by the following method:

- with zero balance indicated, apply a load of, say, 2,4% of the instrument capacity, and press the "zero" button; the instrument should not rezero; and
- reduce the load to, say, 1,6% of the instrument capacity and again press the "zero" button; the instrument should indicate zero balance.

Zero balance — place a small weight equal to, say, 10 graduations  $(10 d_{d})$  on the load receptor before checking "zero". Two readings are taken at each applied load with the instrument equilibrium being disturbed before each reading.

With an additional load of 0,25 d<sub>4</sub>, that is, 10,25 d<sub>4</sub>, on the load receptor, readings of 11 d<sub>4</sub> and 11 d<sub>4</sub> indicate that the alignment of the instrument is not correct, readings of 10 d<sub>4</sub> and 11 d<sub>4</sub> or 10 d<sub>6</sub> and 10 d<sub>4</sub> are acceptable.

With an additional load of 0,75 d<sub>u</sub>, that is, 10,75 d<sub>d</sub>, on the load receptor, readings of 10 d<sub>d</sub> and 10 d<sub>g</sub> indicate that the alignment of the instrument is not correct, readings of 10 d<sub>u</sub> and 11 d<sub>d</sub> or 11 d<sub>d</sub> and 11 d<sub>d</sub> are acceptable.

Level sensitivity — when the instrument is tilted so that the bubble in the level indicator moves 2 mm, zero should not change

<sup>\*</sup> The special tests applicable to the 8130 weight indicator are detailed in Technical Schedule No 6/9C/42.

and, when tested in the tilted position, the instrument should satisfy the weighing-accuracy specifications, that is,  $\pm \frac{1}{2}$  graduation for the first 500 graduations and  $\pm 1$  graduation over 500 and up to 2000 graduations, and  $\pm 1,5$  graduations over 2000 graduations.

Load-cell creep — leaving a maximum-capacity load on the load receptor for a period of 30 minutes should not cause the weight indicator to be incorrect, and on removal of the load the weight indicated should be zero  $\pm 0,25e$ .

<u>Motion-detector sensitivity</u> — removal from the load receptor at any load of a load equal to 1,5 graduations should cause the weight indicator to go blank for a perceptible period before indicating the new load.

<u>Over-capacity indication</u> — when maximum capacity is indicated, placing an additional load equal to one graduation on the load receptor should cause the weight indicator to go blank irrespective of which load receptor or combination of load receptors is selected.

<u>Test loads</u> — the application of the test loads specified in Table 1 and the display of these loads within the applicable tolerance is one method of checking that the instrument operates in accordance with the approved design.



TECHNICAL SCHEDULE No 6/9C/42

VARIATION No 3

Pattern: Toledo Weigning Instrument Model 2084

Submittor: Toledo-Berkel Pty Ltd, 525 Graham Street, Port Melbourne, Victoria, 3207.

Date of Approval of Variation: 18/7/79

- The 8134 mass indicator without automatic tare cancellation. Tare is cancelled by pressing the push-button marked T with no load on the load receptor.
- 2. Model 280 weighing instrument of maximum capacity 50,1 kg by 0,02 kg scale intervals comprising a Model 8135 mass indicator and 45 kg load cell connected through a vertical pullrod to the three-lever system baseworks. The mass indicator and the load cell are both housed in the top section of a headwork cabinet which encloses the pullrod (Figure 12).

The 8135 mass indicator (Figure 13) converts the output from the load cell into a digital mass indication which will be blank above capacity.

The instrument will automatically rezero within 0,25e whenever it comes to rest within 0,45e of zero; this is indicated by the illumination of a light above the word ZERO. A push-button marked Z is provided for rezeroing the instrument when the zero is outside the automatic zero range.

A push-button marked TR allows automatic taring of a container on the load receptor to within 0,25e. On removal of the container the value of the tare to the nearest whole graduation is indicated on the mass indicator prefixed by a minus sign. The tare is subtractive and of maximum effect equal to the capacity of the instrument. When a tare is selected, a light above the letter T is illuminated; the tare is cancelled by pressing the button marked C.

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echnical Schedule No 6/9C/42 - Variation 3

The button marked VT checks that the automatic segment-checking circuitry is operating correctly; when pressed the centre and bottom bars of each numerical indicator remain illuminated. A button marked VA may be provided which checks that the analogue circuitry is operating correctly; when pressed the number marked on the instrument nameplate will be displayed on the mass indicator and the denomination indicator light goes out.

The indicator is retained in its cabinet by a lead-and-wire seal.

The nameplate is marked with the following data:

Manufacturer's nameSerial number of instrumentNSC approval number in the form:NSC approval number in the form:Accuracy class in the form:Maximum capacity in the form:Minimum capacity in the form:Minimum capacity in the form:Minimum capacity in the form:Min 0,4 kg \*Verification scale interval in the form:Tare capacity in the form:Tare capacity in the form:Tare capacity in the form:

An output socket which is mounted inside the cabinet may be used to provide information to peripheral devices which are not a part of the measuring instrument.\*\* These devices, which may only be provided with the authorisation of the Weights and Measures Authority of the State, may, for example, print receipts or store and process the data, etc. This output information is inhibited until the signal sampled in successive counting periods is the same, that is, the instrument is in equilibrium.

The use of such peripheral equipment will not affect the operation of the weighing instrument.

With an alternative (desk-mounted) housing for the 8135 mass indicator as illustrated in Figure 14. In this housing the load cell is permanently connected and the load cell serial number is attached to the mass-indicator seal.

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With the 8135 indicator reading up to 3005 increments.

These markings are repeated on the indicator.

The measuring instrument examined and approved by the Commission is limited to the devices which determine the value of a physical quantity, control the measurement, and indicate the result of the measurement on a visual display, for example, a seven-segment indicator.

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5. With the following load cells, the force applied to each load cell being within the range stated:

Load cell	Load cell	Force applied
type	capacity kg	N
0721	45	175 to 440
0721	90	350 to 880
0723	. 7	30 to 70
0723	11	45 to 110
0723	22	90 to 215
0723	45	175 to 440
0723	90	350 to 880

6. The baseworks of other Commission-approved patterns replacing the basework described in the pattern provided that:

- (a) the basework is of an instrument conventionally known as a platform weighing machine, weighbridge or hopper scale, etc., where the headwork and basework are separate assemblies connected by a mechanical linkage;
- (b) the capacity of the instrument is not more than the capacity approved for the basework;
- (c) additional transfer levers may be used;
- (d) a levelling device and a level indicator are fitted, except for instruments installed in a fixed position or instruments which satisfy the accuracy requirements and tilt tests specified in Test Procedures when tilted to a slope of 1 in 20 in a longitudinal direction and a transverse direction;
- (e) if a level indicator is required, its sensitivity shall be such that, when the instrument is tilted so that the bubble in the level indicator moves 2 mm, the zero will not change by more than two scale intervals, and when zero is reset in the tilted position the instrument will satisfy the accuracy requirements; and
- (f) the instrument is marked with the following approval numbers:

"Headwork NSC No 6/9C/42 Basework NSC No ....."

#### Test Procedures:

As described in Technical Schedule No 6/9C/42 - Variation No 2.

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#### ccuracy Requirements:

he maximum permissible errors are:

 $\pm$  0,5e for loads between zero and 500e inclusive;  $\pm$  le for loads between 501e and 2000e inclusive; and  $\pm$  1,5e for loads above 2000e.

ilt Tests for Other Baseworks:

- a) Tilting at no-load the zero indication should not vary more than 2e when tilted to a slope of 1 in 20, the zero being first adjusted in the reference (level) position.
- b) Tilting when loaded the indication should not vary more than e when tilted to a slope of 1 in 20, the indication at zero being adjusted in the reference position before tilting and in the tilted position before reloading.

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#### TECHNICAL SCHEDULE No 6/9C/42

#### VARIATION No 4

#### Pattern: Toledo Weighing Instrument Model 2084

Submittor: Toledo-Berkel Pty Ltd, 525 Graham Street, Port Melbourne, Victoria, 3207.

#### Description of Variant:

1. A mechanical lever basework of maximum capacity up to 750 kg consisting of a load receptor suspended by four flexure plates from two main levers which are each suspended by two flexure plates from the basework frame. The two levers are joined by a flexure plate and are connected to a Toledo Type 0721 load cell (Figures 15 and 16).

The basework is approved for use with a Type 8130, 8134 or 8135 indicator.

2. A Toledo 133 basework-selector unit allowing the output from up to four load cells, which may be of differing maximum capacities but the same scale interval, to be displayed individually up to 3005 increments, or in combination up to a total not more than 3005 increments, on the one 8130 mass indicator (Figure 17). The calibration circuits of the 8130 indicator are placed in the 133 basework selector, together with a calibration circuit for each additional basework. Overcapacity monitor circuits fade out the indication if the mass on any one of the load receptors is more than the equivalent of five scale intervals above the instrument's maximum capacity with that load receptor selected. The 133 basework-selector unit is retained in its cabinet by a lead-and-wire seal. The serial number of each load cell and the cable from each load cell are sealed to the basework selector. The cables to the mass indicator are sealed to the indicator and to the basework selector. The 133 basework selector is located adjacent to the indicator.

The 133 basework selector is marked with the maximum and minimum capacities and the scale intervals of the baseworks which are connected to it.



### TECHNICAL SCHEDULE No 6/9C/42

### VARIATION No 5

- Pattern: Toledo Weighing Instrument Model 2084
- <u>Submittor</u>: Toledo-Berkel Pty Ltd, 525 Graham Street, Port Melbourne, Victoria, 3207.
  - 1. Description of Variants
    - With basework Model 2085 of 30,05 kg capacity. The load receptor is supported by a Toledo 45 kg cantilever load cell and stayed by five flexure plates (Figures 18 and 19).

1.1 Range

Maximum	number of	verification	
scale	intervals		5005
Minimum	measuring	range	20 kg
Maximum	measuring	range	30,05 kg

- 2. With basework Model 2085 of 60,1 kg capacity. The load receptor is supported by a Toledo 90 kg cantilever load cell and stayed by five flexure plates (Figures 18 and 19).
  - 2.1 Range

Maximum	number of	verification	
scale	intervals		50 <b>05</b>
Minimum	measuring	range	35 kg
Maximum	measuring	range	60,1 kg

The Model 2085 basework is provided with a level indicator and four adjustable feet. Adjacent to the level indicator is a notice advising that the instrument must be level when in use.



#### CANCELLATION CERTIFICATE OF APPROVAL No 6/9C/42

This is to certify that the approval for use for trade granted in respect of the pattern and variants of the

Toledo Weighing Instrument Model 2084

submitted by Toledo Scale (Australia) Ltd (formerly Toledo-Berkel Pty Ltd) 525 Graham Street Port Melbourne Vic 3207

has been cancelled in respect of new instruments as from 31 March 1988.

Instruments which were verified before that date may, with the concurrence of the relevant verifying authority, be submitted for reverification.

Signed

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Executive Director



NOTIFICATION OF CHANGE

# CERTIFICATE OF APPROVAL No 6/9C/42

#### CHANGE No 1

The description of the

Toledo Weighing Instrument Model 2084

given in Technical Schedule No 6/9C/42 - Variation No 2 is altered by the reissue of pages 3 and 4 because of an error in the printing of page 3 in some copies of this Schedule. [The incorrect page 3 is headed "Technical Schedule No 6/18/6 - Variation 1"; it should be destroyed.]



#### NOTIFICATION OF CHANGE

### CERTIFICATE OF APPROVAL No 6/9C/42

#### CHANGE No 2

The description of the

Toledo Weighing Instrument Model 2084

given in Technical Schedule No 6/9C/42 - Variation No 3 is altered by:

replacing Figure 13 with the attached figure.

Note: The word NET has been replaced by the letter T.

31/8/79



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### NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 6/9C/42

CHANGE No 3

Attention is drawn to the fact that Technical Schedule No 6/9C/42, entitled

Toledo Weighing Instrument Model 2084

does not contain a Figure 6, nor is it intended to contain a figure of this number.



29/5/75







29/5/75

Weight Indicator Type 8130

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FIGURE 6/9C/42 - 5



Toledo 132 Basework Selector



29/5/75

FIGURE 6/9C/42 - 9

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Toledo 8134 Weight Indicator

# 23/9/77





Toledo 8134 Weight Indicator - Alternative Housing 23/9/77



Toledo Model 280



Type 8135 Mass Indicator

31/7/79 (replaced 31/8/79)



8135 Desk-mounted Mass Indicator

31/7/79







Toledo 133 Basework-selector Unit

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FIGURE 6/9C/42 - 17



Toledo Basework Model 2085

7/11/80



Basework showing Load Cell and Flexure Plates

7/11/80